

## **APPENDIX G**

### **ESSENTIAL FISH HABITAT (EFH) ASSESSMENT**

This assessment of Essential Fish Habitat (EFH) for the California State Lands Commission (CSLC) Shell Mounds Project is being provided in conformance with the 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act (see FR 62, 244, December 19, 1997). The 1996 amendments to the Magnuson-Stevens Act set forth a number of new mandates for the National Marine Fisheries Service (NMFS), eight regional fishery management councils (Councils), and other federal agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NMFS, are required to delineate EFH for all managed species. Federal action agencies that fund, permit, or carry out activities that may adversely impact EFH are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond in writing to the Service's recommendations. This assessment covers those managed fish species located within an area designated as EFH for the Coastal Pelagics, Pacific Groundfish, and Salmon Management Plans.

#### **G.1 PROPOSED ACTION**

The proposed action has yet to be determined. The CSLC, in consultation with other state and federal agencies, is reviewing several PAs that could provide for the final disposition of the shell mounds, through their removal, modification, or in-place abandonment. Additional background is provided below.

Production of oil and gas reserves by Chevron within State Leases PRC 1824 and PRC 3150 (in the eastern portion of the Santa Barbara Channel offshore Santa Barbara County) began in 1958 with the installation of Platform Hazel. Construction of Platform Hilda was completed in 1960, Platforms Hope and Heidi in 1965. Oil and gas produced from these offshore facilities (collectively known as the "4H platforms") was transported by subsea pipelines to Chevron's onshore processing facility in the City of Carpinteria. During the life of the four platforms production totaled approximately 62.3 million barrels of crude oil and 132.8 million cubic feet of natural gas.

In 1995, the CSLC and the California Coastal Commission (CCC) approved the decommissioning of all four platforms. With the exception of four buried 27-foot diameter caissons at Platform Hazel, Chevron removed most of the platform structures in 1996. With the platform structures removed, the remaining site features are known as the "shell mounds." The shell mounds at all four sites have similar physical characteristics, comprising three distinct strata: an upper layer of shells, an intermediate layer of drill muds and cuttings, and an underlying layer of "native" seafloor sediments. The mounds are roughly semi-circular, approximately 25 to 28 feet in height, with diameters ranging from 180 to 266 feet. The total volume of material contained within the shell mounds is approximately 45,000 cubic yards.

## **Project Objectives**

Following removal of the platforms, Chevron conducted post-abandonment surveys, removal of new debris that had been dropped to the seabed during the course of platform removal operations, and trawl testing to determine if there was any debris in the surveyed area that could snag commercial fishermen's trawl nets. Both the CSLC and the California Coastal Commission required that the sites be "trawlable" as a condition of project completion. The trawl tests determined that commercial trawl gear could not cross the shell mounds without snagging. Chevron subsequently conducted additional debris removal and installed and maintained marker buoys at each of the shell mound sites to enable commercial trawlers to avoid possible damage to their gear.

The Program's objective is to implement one or more actions described within seven identified Program Alternatives (see below as well as Sections 1.3 and 2.0 and Table 1-1) that address the disposition of the shell mounds and Hazel caissons with the least impact and greatest overall, long-term benefit to the environment

## **Description of the Program Alternatives**

In evaluating viable alternatives that meet the need and objectives of the project, six PAs were initially developed. These alternatives are described in more detail in Section 2 and summarized below.

### ***Program Alternative 1 (PA1): Shell Mounds and Caissons Removal and Disposal***

PA1 involves the use of: (1) a barge-mounted, sealed clamshell bucket dredge to remove shell mound materials; (2) explosives and mechanical methods to demolish the caissons at the Hazel site; (3) smoothing of the seafloor across each site with a "gorilla net" trawl to remove remnant materials; and (4) transport of removed materials to POLB or LA-2 for disposal. Barges would be moored at each site via a three- or four-point anchoring system.

### ***Program Alternative 2 (PA2): In-Place Leveling and Spreading of Shell Mounds with Removal of Hazel Caissons***

PA2 involves the use of a standard clamshell dredge to spread or level most of the shell mound materials within an approximate 300 to 1,000 feet (91 to 305 m) radius area around each platform site. Spreading would result in deposition of approximately 1 foot (0.3 m) of shell mound materials over the natural sediments within this area. The remnant Hazel caissons would be removed and transported for disposal using methods previously described, and smoothing of the material would be accomplished with a "gorilla net."

### ***Program Alternative 3 (PA3): In-Place Capping***

This alternative entails placement of sandy material on top of the existing shell mounds. Capping would require anchoring vessels and would result in the complete covering of the exposed mound and some natural seafloor beyond the existing perimeter of each

shell mound. The integrity of the cap would need to be monitored as described in Section 2.3.

***Program Alternative 4 (PA4): In-place Modification (Enhancement) of Shell Mounds as Artificial Reefs***

This alternative would leave the shell mounds at their present locations, but they would be enhanced with CDFG-approved hard substrate to create artificial reefs. The enhancement alternative would consist of placing a two-tiered “ring” of 3 feet (~1 m) diameter, quarried armor-type rock around the perimeter of each of the mounds; the single remnant leg stub at the Hazel site would remain in place. The resulting 6 feet of vertical relief would provide hard substrate upon which epibiota could attach and voids that would be conducive to supporting cryptic fish and invertebrates. As discussed in Section 2.3, additional structures, such as hollow concrete reef balls (T. Raftican, pers. comm.) could conceivably be added to the mounds to augment the amount of hard substrate and increase the vertical relief of the mounds.

***Program Alternative 5 (PA5): Reef Alternative to Removal of the Hazel Caissons***

Under this PA, an artificial reef would be constructed at the Hazel site only, using the caissons as the cornerstones of an artificial reef. Quarry rock of the same dimensions as used for PA4 would be used to fill in the structure of the reef between and around the caissons, resulting in a high-relief artificial reef covering approximately one acre of seafloor. As with PA4, the structure of the reef could be augmented with other materials. The placement of a single relatively large reef at the Hazel site contrasts with the four relatively small reefs that would ring the shell mounds under PA4. There are two variants to this PA, depending on whether the shell mound materials are: a) removed as under PA1; or b) spread as under PA2. Each is discussed separately below. In both cases, the reef would preclude trawling, but provide potential recreational fishing opportunities.

***Program Alternative 6 (PA6): Offsite Mitigation Alternative***

Under this PA, no action to remove or modify the shell mounds is proposed. The shell mounds and remnant caissons would remain in place in their present state.

***No Project Alternative***

Under the No Project Alternative the shell mounds would remain intact.

## **G.2 EFFECTS OF THE PROPOSED ACTION ON EFH**

As detailed in Section 3.3, de Wit (1996) surveyed the marine biota associated with the 4H platforms and shell mounds prior to their removal. That survey indicated at least six species of fish, (blacksmith, rubberlip and pile surfperch, olive and brown rockfish, and kelp bass) were common at and around the platforms, while 47 species of fish had been observed during previous studies on and around the submerged portions of Platforms Hazel and Hilda.

Fish observed on and around the shell mounds during the de Wit study in 2000 included juvenile calico rockfish (*Sebastes dalli*) and the blackeye goby (*Coryphopterus nicholsii*). The numbers of individuals observed in this study were less than the 1998 survey. de Wit (2001) reports that rockfishes (*Sebastes auriculatus*, and *S. spp.*) were present on the shell mounds, but were most common around the exposed pipelines and near the exposed concrete platform leg at Hazel. Blackeye gobies were also observed on the deeper-water shell mounds at platforms Hilda, Heidi, and Hope.

The seafloor habitat within 0.5 miles (0.8 km) of the four shell mounds is predominantly sedimentary, and comprised of silty brown sediment. Common fishes in this habitat include sanddabs (*Citharichthys spp.*), lizardfish (*Synodus lucioceps*), and various commercially important and non-commercial flatfishes (Dames & Moore 1980). Other habitats near the shellmounds include hard bottom areas consisting of both high and low relief rocks and boulders. Three rockfish species (*S. dalli*, *S. auriculatus*, and *S. minatus*) were observed in the water column immediately above and around the boulders southeast of platform Heidi (de Wit 1999).

According to McCrea and Diamond (de Wit 2001), the shell mounds offer limited recreational fishing value, with the most common species caught being croakers, sandbass, and sculpin. Salmon have been caught around the shell mounds since the platform structures have been removed, but catches have been extremely limited and little recreational fishing effort is being expended on salmon.

### **Impact Analysis**

The proposed project is located within an area designated as EFH for three Fishery Management Plans (FMP): Pacific Groundfish, Coastal Pelagic Species (CPS), and Pacific Coast Salmon (PFMC 1998a, 1998b, and 1999 respectively). The groundfish fishery management plan (FMP) includes 82 species that, with a few exceptions, live on or near the bottom of the ocean. Groundfish groups include rockfishes (65 different species, including widow, yellowtail, canary, shortbelly, and vermilion rockfish; bocaccio, chilipepper, cowcod, yelloweye, thornyheads, and Pacific ocean perch), flatfishes (12 species, including various soles, starry flounder, turbot and sanddab), roundfish (six species, including lingcod, cabezon, kelp greenling, Pacific cod, Pacific whiting [hake], and sablefish), sharks and skates (six species - leopard shark, soupfin shark, spiny dogfish, big skate, California skate, and longnose skate), and other species such as ratfish, finescale codling, and Pacific rattail grenadier. The CPS FMP includes northern anchovy, Pacific sardine, chub mackerel, and jack mackerel, while the Pacific Coast Salmon FMP covers numerous salmonids. Of the nearly 90 fish species that are federally managed under these plans, 25 likely occur in the vicinity of the shell mounds and could potentially be affected by the proposed project (Table G-1).

Assessment of potential effects from project activities on managed biological resources is presented in Table G-2. Project activities potentially affecting FMP species include removal or partial removal of the shell mounds by clam shell dredging operations and subsequent offshore or onshore disposal of the dredged material. Temporary impacts to groundfish FMP species could potentially occur by temporarily reducing foraging

**Table G-1. EFH Fish Species Collected Within the Shell Mound Project Area and CDFG Catch Block 652**

<i>Scientific Name</i>	<i>Common Name</i>
COASTAL PELAGIC SPECIES FMP	
<i>Engraulis mordax</i>	Northern anchovy
<i>Sardinops sagax caeruleus</i>	Pacific sardine
<i>Trachurus symmetricus</i>	Jack mackerel
<i>Scomber japonicus</i>	Chub mackerel
PACIFIC COAST GROUND FISH FMP	
<i>Squalus acanthias</i>	Spiny dogfish shark
<i>Triakis semifasciata</i>	Leopard shark
<i>Galeorhinus zyopterus</i>	Soupfin shark
<i>Ophiodon elongatus</i>	Lingcod
<i>Scorpaenichthys marmoratus</i>	Cabazon
<i>Sebastes spp.</i>	Unidentified rockfish
<i>Sebastes auriculatus</i>	Brown rockfish
<i>Sebastes rastrelliger</i>	Grass rockfish
<i>Sebastes serranoides</i>	Olive rockfish
<i>Sebastes atrovirens</i>	Kelp rockfish
<i>Sebastes pinniger</i>	Canary rockfish
<i>Sebastes paucispinis</i>	Bocaccio
<i>Sebastes dallii</i>	Calico rockfish
<i>Sebastes miniatus</i>	Vermillion rockfish
<i>Sebastes carnatus</i>	Gopher rockfish
<i>Sebastes chrysomelas</i>	Black-and-yellow rockfish
<i>Sebastes goodei</i>	Chilipepper
<i>Scorpaena guttata</i>	California scorpionfish
<i>Eopsetta jordani</i>	Petrable sole
PACIFIC COAST SALMON FMP	
<i>Oncorhynchus spp.</i>	Salmon
<i>Oncorhynchus tshawytscha</i>	Chinook Salmon
Sources: de Wit (1996) and CDFG Catch Block Data (1994-1998)	

habitat, increasing turbidity, and decreasing water quality. However, due to the highly mobile nature of these species in the project area, impacts would be localized and/or transient. Therefore, potential impacts to groundfish FMP species would be less than significant.

Similarly, shell mound removal activities by dredging could impact pelagic species by temporarily decreasing visibility for foraging activities as a result of increased turbidity and decreasing water quality. Similar to groundfishes, impacts to CPS FMP species also would be temporary and localized. In contrast, some short-term benefits could occur as a result of dredging activities. For example, increased prey availability due to resuspended material during dredging may attract some pelagic schooling fishes. Nonetheless, potential adverse impacts to coastal pelagic FMP species would be less than significant.

Although salmon are taken commercially and recreationally in the project area, their abundance and distribution are highly variable. Impacts to Pacific Coast salmon are expected to be similar to those described above for Pacific Groundfish and CPS FMP species. Pacific Coast salmon may experience temporarily reductions in foraging habitat, increased turbidity, and decreased water quality, but due to their highly mobile nature, will be able to avoid the area during project activities. However, as described above for coastal pelagic species, some short-term benefits may occur as a result of project activities. Since salmon feed on many of the coastal pelagic species, any large schools of coastal pelagic species could provide prey to salmon within the project area.

**Table G-2. Summary of Potential Effects of the Proposed Program Alternatives on FMP Species.**

<i>Program Alternative</i>	<i>Impact Assessment</i>
PA1	<p>Removal of the 4H Shell Mounds would permanently remove contaminated sediments associated with the shell mounds from the marine environment (Class IV).</p> <p>Commercial and recreational fishing would be precluded in the project vicinity during project activities (Class II).</p> <p>Contaminants, including oil, released during project operations will disperse into the water column and onto the seafloor, resulting in the exposure of commercially and recreationally fished species to contaminants, with potential toxic or bioaccumulation effects (see WQ-2 and MB-3) (Class II).</p> <p>Explosive demolition of the caissons at the Hazel site will result in the mortality of fishes that are commercially or recreationally harvested in the immediate vicinity (Class II).</p> <p>The transport of materials may interfere with fishing boats, result in accidental spillage that could expose fishery resources to contaminants, or otherwise conflict with fishing activities (Class II).</p>

**Table G-2. Summary of Potential Effects of the Proposed Program Alternatives on FMP Species.**

<i>Program Alternative</i>	<i>Impact Assessment</i>
	Removal of the 4H shell mounds and caissons would restore trawling and other types of fishing to the areas occupied by and adjacent to the mounds where such fishing activities have been prevented (Class IV).
PA2	<p>Commercial and recreational fishing would be precluded in the project vicinity during project activities (Class II).</p> <p><b>Contaminants, including oil, released during project operations will disperse into the water column and onto the seafloor, resulting in the exposure of commercially and recreationally fished species to contaminants, with potential toxic or bioaccumulation effects (Class I).</b></p> <p>Explosive demolition of the caissons at the Hazel site will result in the mortality of fishes that are commercially or recreationally harvested in the immediate vicinity (Class II).</p> <p>The transport of materials may interfere with fishing boats, result in accidental spillage that could expose fishery resources to contaminants, or otherwise conflict with fishing activities (Class II).</p>
PA3	<p>Commercial and recreational fishing would be precluded in the project vicinity during project activities (Class II).</p> <p>Contaminants, including oil, released during project operations will disperse into the water column and onto the seafloor, resulting in the exposure of commercially and recreationally fished species to contaminants, with potential toxic or bioaccumulation effects (see WQ-2 and MB-3) (Class II).</p> <p>The transport of materials may interfere with fishing boats, result in accidental spillage that could expose fishery resources to contaminants, or otherwise conflict with fishing activities (Class II)</p> <p>The shell mounds and/or new materials may preclude certain types of fishing within the surrounding area (Class II).</p> <p>Due to the continuing presence of the shell mounds, there is a continuing risk of exposure to contaminants from future disturbance or erosion of the mounds (Class II).</p>
PA4	<p>Commercial and recreational fishing would be precluded in the project vicinity during project activities (Class II).</p> <p>Contaminants, including oil, released during project operations will disperse into the water column and onto the seafloor, resulting in the exposure of commercially and</p>

**Table G-2. Summary of Potential Effects of the Proposed Program Alternatives on FMP Species.**

<i>Program Alternative</i>	<i>Impact Assessment</i>
	<p>recreationally fished species to contaminants, with potential toxic or bioaccumulation effects (see WQ-2 and MB-3) (Class II).</p> <p>The transport of materials may interfere with fishing boats, result in accidental spillage that could expose fishery resources to contaminants, or otherwise conflict with fishing activities (Class II).</p> <p>The shell mounds and/or new materials may preclude certain types of fishing within the surrounding area (Class II).</p> <p>Due to the continuing presence of the shell mounds, there is a continuing risk of exposure to contaminants from future disturbance or erosion of the mounds (Class II).</p> <p>Creation of artificial reefs would benefit recreational fishing opportunities (Class IV).</p>
PA5a	<p>Removal of the 4H Shell Mounds would permanently remove contaminated sediments associated with the shell mounds from the marine environment (Class IV).</p> <p>Commercial and recreational fishing would be precluded in the project vicinity during project activities (Class III).</p> <p>Contaminants, including oil, released during project operations will disperse into the water column and onto the seafloor, resulting in the exposure of commercially and recreationally fished species to contaminants, with potential toxic or bioaccumulation effects (see WQ-2 and MB-3) (Class II).</p> <p>The transport of materials may interfere with fishing boats, result in accidental spillage that could expose fishery resources to contaminants, or otherwise conflict with fishing activities (Class II).</p> <p>The shell mounds and/or new materials may preclude certain types of fishing within the surrounding area (Class II).</p> <p>Creation of artificial reefs would benefit recreational fishing opportunities (Class IV).</p>
PA5b	Same as 5a.
PA6	<p>The shell mounds and/or new materials may preclude certain types of fishing within the surrounding area (Class II).</p> <p>Due to the continuing presence of the shell mounds, there is a continuing risk of exposure to contaminants from future disturbance or erosion of the mounds (Class II).</p>



### G.3 MITIGATION MEASURES

With the incorporation of mitigation measures identified in Section 3.5.4, all impacts that are associated with PA1, PA3, PA4, PA5, and PA6, and identified as Class II, would be mitigated to less than significant residual impacts.

Under PA2, the potential for the release of toxic materials and exposure of commercially- and recreationally-fished species to contaminants are Class I impacts and cannot be mitigated. Class II impacts identified under PA 2 can be mitigated to less than significant residual impacts

A complete description of impacts and mitigation measures is presented in Section 3.5.4.

### G.4 REFERENCES

- Dames & Moore. 1980. *EIR/EA for Platform Gina and Platform Gilda Project, Leases OCS P-0202 and P-0216, Volume II*. Prepared for the City of Oxnard and the U.S. Geological Service. May.
- de Wit, L. A., 2001. *Shell Mounds Environmental Review, Volume I, Technical Report*. Prepared for the California State Lands and Coastal Commissions. Bid Log RFP99-05. March.
- \_\_\_\_\_. 1999. *4H Platforms Shell Mound Study, Santa Barbara, California*. Prepared for Chevron U.S.A., Inc., Ventura, California. January.
- \_\_\_\_\_. 1996. *Effects of Underwater Detonations on Marine Fishes and Invertebrates, Chevron 4-H Platform Removal, Santa Barbara Channel, California*. Prepared for the Marine Mammal Consulting Group. September.
- PFMC. 1999. *Identification and Description of Essential Fish Habitat, Adverse Impacts, and Recommended Conservation Measures for Salmon, Appendix A*. Pacific Fishery Management Council, Portland, Oregon. August.
- \_\_\_\_\_. 1998a. *Final Environmental Assessment/ Regulatory Impact Review for Amendment 11*. Pacific Coast Groundfish Fishery Management Plan. Pacific Fishery Management Council, Portland, Oregon. October.
- \_\_\_\_\_. 1998b. *Amendment 8 to the Northern Anchovy Fishery Management Plan: The Coastal Pelagic Species Fishery Management Plan*. Pacific Fishery Management Council, Portland, Oregon. December.